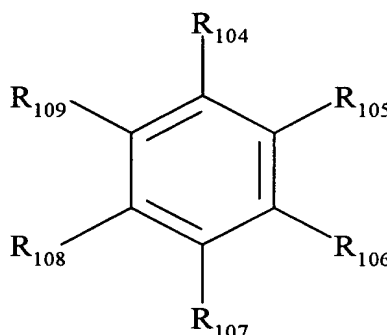


Amendments to the Claims:

Listing of Claims:

1. (Currently Amended) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with ~~ethylenically unsaturated monomers~~ vinyl aromatic monomer, comprising adding to said mixture ~~an effective~~ a living polymer growth inhibiting amount of at least one inhibitor that is a hydrogen donor ~~or electron acceptor~~ selected from the group consisting of inhibitors of the structure



wherein

R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀, NR₁₁₀, SR₁₁₀, NO₂, NO, CN, COR₁₁₂, and halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ is OH or NHR₁₁₀ and at least one of R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ is NO₂;

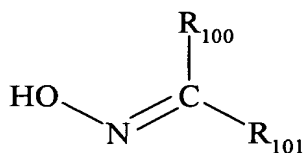
R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl, or R₁₁₀ and R₁₁₁ can be taken together to form a ring structure of five to seven members;

R₁₁₂ is R₁₀₂, OR₁₀₂, or NR₁₀₂R₁₀₃; and

R₁₀₂ and R₁₀₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R₁₀₂ and R₁₀₃ can be taken together to form a ring structure of five to seven members.

2 - 3 (Canceled)

4. (Withdrawn - Currently Amended) The method of claim 2 ~~wherein the 1 further comprising an inhibitor is~~ of the structure



wherein

R₁₀₀ and R₁₀₁ are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl, COR₁₀₂, COOR₁₀₂, CONR₁₀₂R₁₀₃, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R₁₀₀ and R₁₀₁ can be taken together to form a ring structure of five to seven

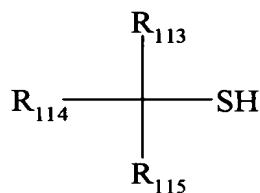
members; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

5. (Canceled)
6. (Currently Amended) The method of claim 5 1 wherein R_{104} is OH.
7. (Withdrawn) The method of claim 6 wherein R_{107} is OH.
8. (Withdrawn) The method of claim 6 wherein R_{105} is OH.
9. (Original) The method of claim 6 wherein at least one of R_{105} and R_{107} is NO_2 .
10. (Withdrawn) The method of claim 6 wherein at least one of R_{105} and R_{107} is NO.
11. (Withdrawn - Currently Amended) The method of claim 5 1 wherein R_{104} is NHR_{110} and at least one of R_{105} and R_{107} is NO_2 .

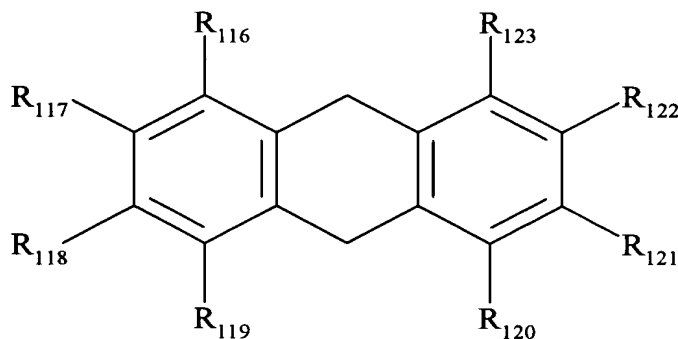
12. (Withdrawn - Currently Amended) The method of claim 5 1 wherein R_{104} is NHR_{110} , R_{107} is $NR_{110}R_{111}$, and R_{111} is phenyl.

13. (Withdrawn - Currently Amended) The method of claim 2 ~~wherein the 1 further~~
comprising an inhibitor is of the structure



wherein R_{113} , R_{114} , and R_{115} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

14. (Withdrawn - Currently Amended) The method of claim 2 1 wherein the inhibitor is of the structure



wherein

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R_{116} , R_{117} , R_{118} , R_{119} , R_{120} , R_{121} , R_{122} , and R_{123} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $NR_{110}R_{111}$, SR_{110} , NO_2 , NO , CN , COR_{112} , halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

R_{112} is R_{102} , OR_{102} , or $NR_{102}R_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

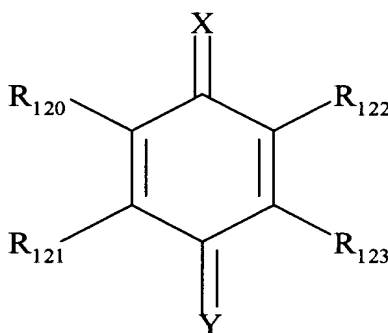
15. (Canceled)

16. (Currently Amended) The method of claim 2 1 wherein a transition metal is added.

17. (Original) The method of claim 16 wherein the transition metal is copper.

18. (Withdrawn - Currently Amended) The method of claim 1 ~~wherein the~~ further comprising an inhibitor that is an electron acceptor.

19. (Withdrawn) The method of claim 18 wherein the inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR₁₁₀, and

CR₁₂₄R₁₂₅;

R₁₂₀, R₁₂₁, R₁₂₂, and R₁₂₃ are independently selected from the group consisting of hydrogen,

alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀,

NR₁₁₀R₁₁₁, SR₁₁₀, NO, NO₂, CN, COR₁₁₂, and halogen, or R₁₂₀ and R₁₂₁ can be taken

together and/or R₁₂₂ and R₁₂₃ can be taken together to form one or two ring structures,

respectively, either of which can be of five to seven members;

R₁₂₄ and R₁₂₅ are independently selected from the group consisting of hydrogen, alkyl, aryl,

cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀, NR₁₁₀R₁₁₁, SR₁₁₀,

NO₂, NO, CN, COR₁₁₂, halogen, and/or can be taken together to form a ring structure of five to seven members,

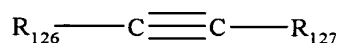
R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR₁₀₂, or R₁₁₀ and R₁₁₁ can be taken together to form a ring structure of five to seven members;

R₁₁₂ is R₁₀₂, OR₁₀₂, or NR₁₀₂R₁₀₃; and

R₁₀₂ and R₁₀₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R₁₀₂ and R₁₀₃ can be taken together to form a ring structure of five to seven members.

20. (Withdrawn) The method of claim 19 wherein X and Y are oxygen.
21. (Withdrawn) The method of claim 19 wherein X is oxygen and Y is CR₁₂₄R₁₂₅.
22. (Withdrawn) The method of claim 19 wherein X is oxygen and Y is NR₁₁₀.
23. (Withdrawn) The method of claim 19 wherein X and Y are NR₁₁₀.
24. (Withdrawn) The method of claim 21 wherein X is NR₁₁₀ and Y is CR₁₂₄R₁₂₅.

25. (Withdrawn) The method of claim 18 wherein the inhibitor is of the structure



wherein

R_{126} and R_{127} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $NR_{110}R_{111}$, SR_{110} , NO_2 , NO , CN , COR_{112} , and halogen,

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

R_{112} is R_{102} , OR_{102} , or $NR_{102}R_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

26. (Withdrawn) The method of claim 18 wherein the inhibitor is selected from the group consisting of phenylacetylene, 2,5-di-t-butyl-1,4-benzoquinone, 2,6-di-t-butyl-1,4-benzoquinone, 1,4-benzoquinone, 2-methylantraquinone, 1,4-naphthoquinone, 2,6-di-t-butyl-4-(phenylmethylene)-2,5-cyclohexadiene-1-one, 2,6-di-t-butyl-4-(phenylimino)-2,5-

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cyclohexadiene-1-one, and ethyl 3,4-bis-(3,5-di-t-butyl-4-one-2,5-cyclohexadienylidene)-hexane-1,6-dioate

27. (Withdrawn) The method of claim 18 wherein a transition metal is added.
28. (Withdrawn) The method of claim 27 wherein the transition metal is copper..
29. (Canceled)
30. (Currently Amended) Method of claim 1 wherein said ~~monomers contain~~ vinyl aromatic monomer contains impurities from ~~the monomer~~ said monomer's production and/or purification processes.
31. (Currently Amended) Method of claim 1 wherein the mixture comprises polymer formed during ~~the~~ said vinyl aromatic monomer's production and/or purification processes.
32. (Currently Amended) Method of claim 31 wherein the polymer formed during the production and/or purification processes is soluble in the vinyl aromatic monomer stream.
33. (Currently Amended) Method of claim 31 wherein the polymer formed during the production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

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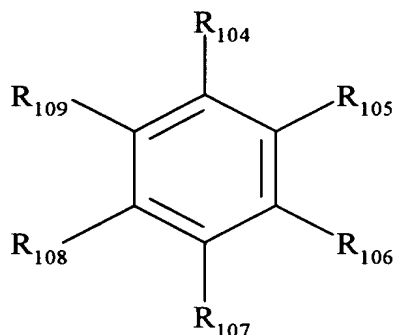
34. (Currently Amended) Method of claim 1 wherein said ~~monomers are~~ vinyl aromatic monomer is undergoing purification by distillation.
35. (Original) Method of claim 34 wherein the distillation process occurs at pressures less than 760 mm Hg.
36. (Original) Method of claim 34 wherein the distillation process is a continuous process.
37. (Original) Method of claim 34 wherein the equipment in which the distillation process occurs contains polymer.
38. (Currently Amended) Method of claim 37 wherein the polymer was formed during ~~the monomer's~~ production and/or purification processes of vinyl aromatic monomer.
39. (Currently Amended) Method of claim 37 wherein the polymer is not dissolved in the vinyl aromatic monomer stream.
40. (Currently Amended) Method of claim 34 wherein said ~~monomers contain~~ vinyl aromatic monomer contains impurities from ~~the monomer~~ said vinyl aromatic monomer's production and/or purification processes.

41. (Currently Amended) Method of claim 34 wherein the mixture comprises vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes.

42. (Currently Amended) Method of claim 41 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is soluble in the vinyl aromatic monomer stream.

43. (Currently Amended) Method of claim 41 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

44. (Currently Amended) A method for inhibiting the polymer growth of living vinyl aromatic polymer previously formed in the presence of a nitroxyl inhibitor in admixture with ~~ethylenically unsaturated monomers~~ vinyl aromatic monomer, comprising adding to said mixture a living polymer growth inhibiting amount of
A) at least one first inhibitor that is a hydrogen donor ~~or electron-acceptor~~ selected from the group consisting of inhibitors of the structure



wherein

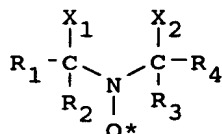
R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀, NR₁₁₀R₁₁₁, SR₁₁₀, NO₂, NO, CN, COR₁₁₂, and halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ is OH or NHR₁₁₀ and at least one of R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ is NO₂;

R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl, or R₁₁₀ and R₁₁₁ can be taken together to form a ring structure of five to seven members;

R₁₁₂ is R₁₀₂, OR₁₀₂, or NR₁₀₂R₁₀₃; and

R₁₀₂ and R₁₀₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R₁₀₂ and R₁₀₃ can be taken together to form a ring structure of five to seven members; and

B) at least one second inhibitor having the following structural formula:



wherein

R₁ and R₄ are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl;

R₂ and R₃ are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl; and

X₁ and X₂

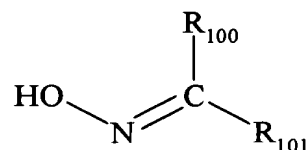
(1) are independently selected from the group consisting of halogen, cyano, amido, -S-C₆H₅, carbonyl, alkenyl, alkyl of 1 to 15 carbon atoms, COOR₇, -S-COR₇, and -OCOR₇, wherein R₇ is alkyl or aryl, or

(2) taken together, form a ring structure with the nitrogen.

45. (Canceled)

46. (Canceled)

47. (Withdrawn - Currently Amended) The method of claim ~~45~~ wherein the first 44
further comprising an inhibitor is of the structure



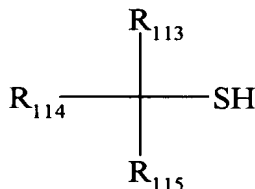
wherein

- R_{100} and R_{101} are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl, COR_{102} , COOR_{102} , $\text{CONR}_{102}\text{R}_{103}$, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{100} and R_{101} can be taken together to form a ring structure of five to seven members; and
- R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

48. (Canceled)

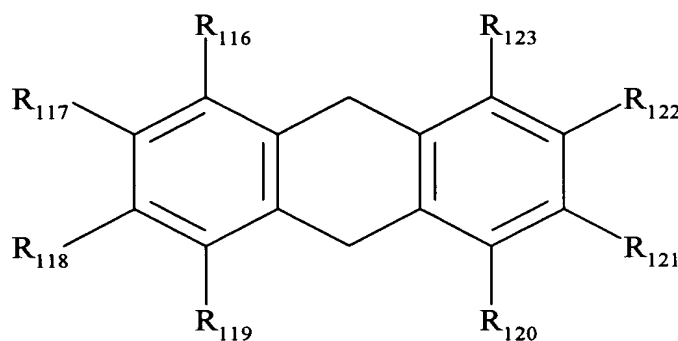
49. (Currently Amended) The method of claim ~~48~~ 44 wherein R_{104} is OH.

50. (Withdrawn) The method of claim 49 wherein R_{107} is OH.
51. (Withdrawn) The method of claim 49 wherein R_{105} is OH.
52. (Original) The method of claim 49 wherein at least one of R_{105} and R_{107} is NO_2 .
53. (Withdrawn) The method of claim 49 wherein at least one of R_{105} and R_{107} is NO.
54. (Withdrawn - Currently Amended) The method of claim ~~48~~ 44 wherein R_{104} is NHR_{110} and at least one of R_{105} and R_{107} is NO_2 .
55. (Withdrawn - Currently Amended) The method of claim ~~48~~ 44 wherein R_{104} is NHR_{110} , R_{107} is $\text{NR}_{110}\text{R}_{111}$, and R_{111} is phenyl.
56. (Withdrawn - Currently Amended) The method of claim ~~45~~ wherein the first 44
further comprising an inhibitor is of the structure



wherein R_{113} , R_{114} , and R_{115} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

57. (Withdrawn - Currently Amended) The method of claim ~~45~~ 44 wherein the first inhibitor is of the structure



wherein

R_{116} , R_{117} , R_{118} , R_{119} , R_{120} , R_{121} , R_{122} , and R_{123} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $NR_{110}R_{111}$, SR_{110} , NO_2 , NO , CN , COR_{112} , halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

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R_{112} is R_{102} , OR_{102} , or $NR_{102}R_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

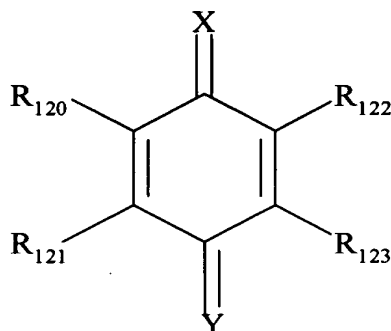
58. (Canceled)

59. (Currently Amended) The method of claim ~~45~~ 44 wherein a transition metal is added.

60. (Original) The method of claim 59 wherein the transition metal is copper.

61. (Withdrawn - Currently Amended) The method of claim 44 ~~wherein the first~~ further comprising an inhibitor that is an electron acceptor.

62. (Withdrawn - Currently Amended) The method of claim 61 wherein the first inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR₁₁₀, and CR₁₂₄R₁₂₅;

R₁₂₀, R₁₂₁, R₁₂₂, and R₁₂₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀, NR₁₁₀R₁₁₁, SR₁₁₀, NO, NO₂, CN, COR₁₁₂, and halogen, or R₁₂₀ and R₁₂₁ can be taken together and/or R₁₂₂ and R₁₂₃ can be taken together to form one or two ring structures, respectively, either of which can be of five to seven members;

R₁₂₄ and R₁₂₅ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀, NR₁₁₀R₁₁₁, SR₁₁₀, NO₂, NO, CN, COR₁₁₂, halogen, and/or can be taken together to form a ring structure of five to seven members;

R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl,

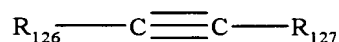
benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} , or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

R_{112} is R_{102} , OR_{102} , or $\text{NR}_{102}\text{R}_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

63. (Withdrawn) The method of claim 62 wherein X and Y are oxygen.
64. (Withdrawn) The method of claim 62 wherein X is oxygen and Y is $\text{CR}_{124}\text{R}_{125}$.
65. (Withdrawn) The method of claim 62 wherein X is oxygen and Y is NR_{110} .
66. (Withdrawn) The method of claim 62 wherein X and Y are NR_{110} .
67. (Withdrawn) The method of claim 62 wherein X is NR_{110} and Y is $\text{CR}_{124}\text{R}_{125}$.

68. (Withdrawn - Currently Amended) The method of claim 55 ~~wherein the~~ further comprising an inhibitor is of the structure



wherein

R_{126} and R_{127} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $NR_{110}R_{111}$, SR_{110} , NO_2 , NO, CN, COR_{112} , and halogen,

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

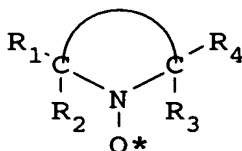
R_{112} is R_{102} , OR_{102} , or $NR_{102}R_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

69. (Withdrawn) The method of claim 61 wherein the first inhibitor is selected from the group consisting of phenylacetylene, 2,5-di-t-butyl-1,4-benzoquinone, 2,6-di-t-butyl-1,4-benzoquinone, 1,4-benzoquinone, 2-methylanthraquinone, 1,4-naphthoquinone, 2,6-di-t-butyl-4-(phenylmethylene)-2,5-cyclohexadiene-1-one, 2,6-di-t-butyl-4-(phenylimino)-2,5-

cyclohexadiene-1-one, and ethyl 3,4-bis-(3,5-di-t-butyl-4-one-2,5-cyclohexadienylidene)-hexane-1,6-dioate.

70. (Withdrawn) The method of claim 61 wherein a transition metal is added.
71. (Withdrawn) The method of claim 70 wherein the transition metal is copper.
72. (Withdrawn) The method of claim 44 wherein the first inhibitor is a blend of a hydrogen donor and an electron acceptor.
73. (Original) The method of claim 44 wherein the second inhibitor is of the structure



wherein R_1 and R_4 are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl and R_2 and R_3 are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl, and the



portion represents the atoms necessary to form a five-, six-, or seven-membered heterocyclic ring.

74. (Withdrawn) The method of claim 44 wherein the second inhibitor is a blend of two nitroxyls.

75. (Original) The method of claim 73 wherein the second inhibitor contains one or more nitroxyls selected from the group consisting of:

N,N-di-*tert*-butylnitroxide;

N,N-di-*tert*-amylnitroxide;

N-*tert*-butyl-2-methyl-1-phenyl-propylnitroxide;

N-*tert*-butyl-1-diethylphosphono-2,2-dimethylpropylnitroxide;

2,2,6,6-tetramethyl-piperidinyloxy;

4-amino-2,2,6,6-tetramethyl-piperidinyloxy;

4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;

4-oxo-2,2,6,6-tetramethyl-piperidinyloxy;

4-dimethylamino-2,2,6,6-tetramethyl-piperidinyloxy;

4-ethanoyloxy-2,2,6,6-tetramethyl-piperidinyloxy;

2,2,5,5-tetramethylpyrrolidinyloxy;

3-amino-2,2,5,5-tetramethylpyrrolidinyloxy;

2,2,4,4-tetramethyl-1-oxa-3-azacyclopentyl-3-oxy;

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2,2,4,4-tetramethyl-1-oxa-3-pyrrolinyl-1-oxy-3-carboxylic acid;
2,2,3,3,5,5,6,6-octamethyl-1,4-diazacyclohexyl-1,4-dioxy;
4-bromo-2,2,6,6-tetramethyl-piperidinyloxy;
4-chloro-2,2,6,6-tetramethyl-piperidinyloxy;
4-iodo-2,2,6,6-tetramethyl-piperidinyloxy;
4-fluoro-2,2,6,6-tetramethyl-piperidinyloxy;
4-cyano-2,2,6,6-tetramethyl-piperidinyloxy;
4-carboxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbomethoxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbethoxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-cyano-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-methyl-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbethoxy-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-hydroxy-4-(1-hydroxypropyl)-2,2,6,6-tetramethyl-piperidinyloxy;
4-methyl-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-carboxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-carbomethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-carbethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-amino-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-amido-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
3,4-diketo-2,2,5,5-tetramethylpyrrolidinyloxy;

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3-keto-4-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;
3-keto-4-benzylidene-2,2,5,5-tetramethylpyrrolidinyloxy;
3-keto-4,4-dibromo-2,2,5,5-tetramethylpyrrolidinyloxy;
2,2,3,3,5,5-hexamethylpyrrolidinyloxy;
3-carboximido-2,2,5,5-tetramethylpyrrolidinyloxy;
3-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;
3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-cyano-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-carbomethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-carbethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
2,2,5,5-tetramethyl-3-carboxamido-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-amino-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-carbethoxy-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-cyano-2,5-dihydropyrrole-1-oxyl;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)succinate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)sebacate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)n-butylmalonate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)phthalate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)isophthalate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)terephthalate;

bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)hexahydroterephthalate;
N,N'-bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipamide;
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-caprolactam;
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-dodecylsuccinimide;
2,4,6-tris-[N-butyl-N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)]-s-triazine; and
4,4'-ethylenebis(1-oxyl-2,2,6,6-tetramethylpiperazin-3-one).

76. (Currently Amended) Method of claim 44 wherein said ~~monomers contain~~ vinyl aromatic monomer contains impurities from ~~the monomer~~ said monomer's production and/or purification processes.

77. (Currently Amended) Method of claim 44 wherein the mixture comprises polymer formed during ~~the~~ said vinyl monomer's production and/or purification processes.

78. (Currently Amended) Method of claim 77 wherein the polymer formed during the production and/or purification processes is soluble in the vinyl aromatic monomer stream.

79. (Currently Amended) Method of claim 77 wherein the polymer formed during the production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

80. (Currently Amended) Method of claim 44 wherein said ~~monomers are~~ vinyl aromatic monomer is undergoing purification by distillation.

81. (Original) Method of claim 80 wherein the distillation process occurs at pressures less than 760 mm Hg.

82. (Original) Method of claim 80 wherein the distillation process is a continuous process.

83. (Original) Method of claim 80 wherein the equipment in which the distillation process occurs contains polymer.

84. (Currently Amended) Method of claim 83 wherein the polymer was formed during ~~the monomer's~~ production and/or purification processes of vinyl aromatic monomer.

85. (Currently Amended) Method of claim 83 wherein the polymer is not dissolved in the vinyl aromatic monomer stream.

86. (Currently Amended) Method of claim 80 wherein said ~~monomers contain~~ vinyl aromatic monomer contains impurities from ~~the monomer~~ said vinyl aromatic monomer's production and/or purification processes.

87. (Currently Amended) Method of claim 80 wherein the mixture comprises vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes.

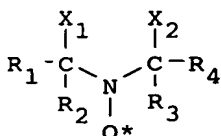
88. (Currently Amended) Method of claim 87 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is soluble in the vinyl aromatic monomer stream.

89. (Currently Amended) Method of claim 87 wherein the vinyl aromatic polymer formed during the vinyl aromatic monomer's production and/or purification processes is insoluble in the vinyl aromatic monomer stream.

90. (Withdrawn) A composition comprising:

A) at least one first inhibitor that is a hydrogen donor or an electron acceptor and

B) at least one second inhibitor having the following structural formula:



wherein

R₁ and R₄ are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl;

R_2 and R_3 are independently selected from the group consisting of alkyl and heteroatom-substituted alkyl; and

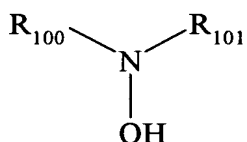
X_1 and X_2

(1) are independently selected from the group consisting of halogen, cyano, amido, $-S-C_6H_5$, carbonyl, alkenyl, alkyl of 1 to 15 carbon atoms, $COOR_7$, $-S-COR_7$, and $-OCOR_7$, wherein R_7 is alkyl or aryl, or

(2) taken together, form a ring structure with the nitrogen.

91. (Withdrawn) The composition of claim 90 wherein the first inhibitor is a hydrogen donor.

92. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



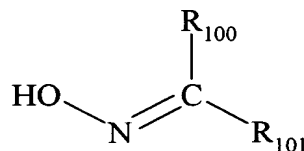
wherein

R_{100} and R_{101} are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl, COR_{102} , $COOR_{102}$, $CONR_{102}R_{103}$, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{100} and R_{101} can be taken together to form a ring structure of five to seven

members; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

93. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure

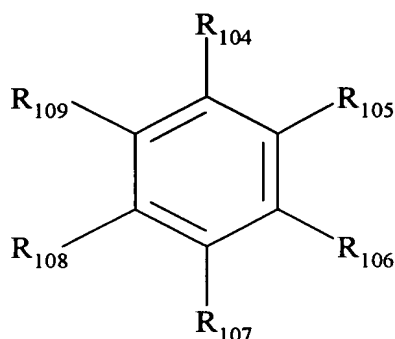


wherein

R_{100} and R_{101} are independently selected from the group consisting of hydrogen, alkyl, alkylidene, benzylidene, aryl, benzyl, COR_{102} , $COOR_{102}$, $CONR_{102}R_{103}$, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{100} and R_{101} can be taken together to form a ring structure of five to seven members; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

94. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀,

NR₁₁₀R₁₁₁, SR₁₁₀, NO₂, NO, CN, COR₁₁₂, halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members, provided that at least one of R₁₀₄, R₁₀₅, R₁₀₆, R₁₀₇, R₁₀₈, and R₁₀₉ is OH or NHR₁₁₀;

R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR₁₀₂, or R₁₁₀ and R₁₁₁ can be taken together to form a ring structure of five to seven members;

R₁₁₂ is R₁₀₂, OR₁₀₂, or NR₁₀₂R₁₀₃; and

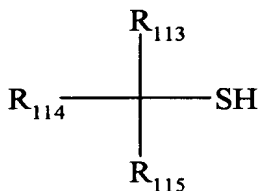
R₁₀₂ and R₁₀₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C,

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O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

95. (Withdrawn) The composition of claim 94 wherein R_{104} is OH.
96. (Withdrawn) The composition of claim 95 wherein R_{107} is OH.
97. (Withdrawn) The composition of claim 95 wherein R_{105} is OH.
98. (Withdrawn) The composition of claim 95 wherein at least one of R_{105} and R_{107} is NO_2 .
99. (Withdrawn) The composition of claim 95 wherein at least one of R_{105} and R_{107} is NO.
100. (Withdrawn) The composition of claim 94 wherein R_{104} is NHR_{110} and at least one of R_{105} and R_{107} is NO_2 .
101. (Withdrawn) The composition of claim 94 wherein R_{104} is NHR_{110} , R_{107} is $NR_{110}R_{111}$, and R_{111} is phenyl.

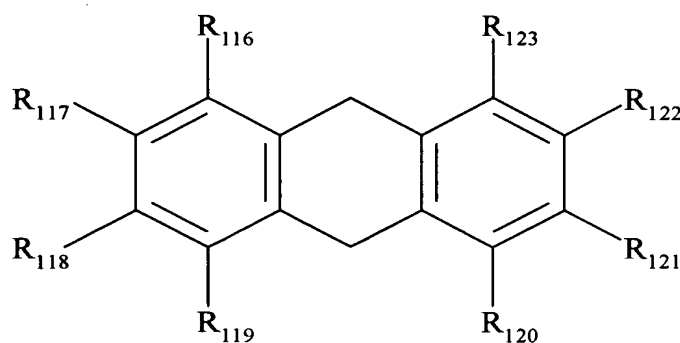
102. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R₁₁₃, R₁₁₄, and R₁₁₅ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, and heterocyclic moieties.

103. (Withdrawn) The composition of claim 91 wherein the first inhibitor is of the structure



wherein

R₁₁₆, R₁₁₇, R₁₁₈, R₁₁₉, R₁₂₀, R₁₂₁, R₁₂₂, and R₁₂₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl,

substituted aryl, OR₁₁₀, NR₁₁₀R₁₁₁, SR₁₁₀, NO₂, NO, CN, COR₁₁₂, halogen, and/or any two adjacent groups can be taken together to form ring structure(s) of five to seven members;

R₁₁₀ and R₁₁₁ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR₁₀₂ or R₁₁₀ and R₁₁₁ can be taken together to form a ring structure of five to seven members;

R₁₁₂ is R₁₀₂, OR₁₀₂, or NR₁₀₂R₁₀₃; and

R₁₀₂ and R₁₀₃ are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R₁₀₂ and R₁₀₃ can be taken together to form a ring structure of five to seven members.

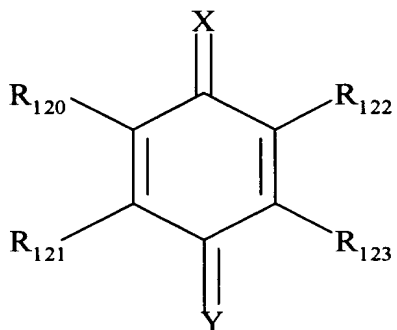
104. (Withdrawn) The composition of claim 91 wherein the first inhibitor is selected from the group consisting of diethylhydroxylamine, cyclohexanoneoxime, dibenzylhydroxylamine, 2,4-dinitro-6-sec-butylphenol, N-phenyl-N'-(1,4-dimethylpentyl)-para-phenylenediamine, 2,5-di-t-butylhydroquinone, 2,5-di-t-amylhydroquinone, methylhydroquinone, 4-t-butylhydroquinone, 4-t-butylcatechol, octanethiol, 2,6-di-t-butyl-4-ethylphenol/Cu(I)naphthenate, dihydroanthracene, N-t-butyl-2-benzothiazole-sulfenamide, and N-methyl-4-nitroaniline.

105. (Withdrawn) The composition of claim 91 wherein a transition metal is added.

106. (Withdrawn) The composition of claim 105 wherein the transition metal is copper.

107. (Withdrawn) The composition of claim 90 wherein the first inhibitor is an electron acceptor.

108. (Withdrawn) The composition of claim 107 wherein the first inhibitor is of the structure



wherein

X and Y are independently selected from the group consisting of oxygen, NR₁₁₀, and

CR₁₂₄R₁₂₅,

R₁₂₀, R₁₂₁, R₁₂₂, and R₁₂₃ are independently selected from the group consisting of hydrogen,

alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR₁₁₀,

NR₁₁₀R₁₁₁, SR₁₁₀, NO, NO₂, CN, COR₁₁₂, and halogen, or R₁₂₀ and R₁₂₁ can be taken

together and/or R_{122} and R_{123} can be taken together to form one or two ring structures, respectively, either of which can be of five to seven members;

R_{124} and R_{125} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $NR_{110}R_{111}$, SR_{110} , NO_2 , NO , CN , COR_{112} , halogen, and/or can be taken together to form a ring structure of five to seven members;

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} , or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

R_{112} is R_{102} , OR_{102} , or $NR_{102}R_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

109. (Withdrawn) The composition of claim 108 wherein X and Y are oxygen.

110. (Withdrawn) The composition of claim 108 wherein X is oxygen and Y is $CR_{124}R_{125}$.

111. (Withdrawn) The composition of claim 108 wherein X is oxygen and Y is NR_{110} .

112. (Withdrawn) The composition of claim 108 wherein X and Y are NR_{110} .

113. (Withdrawn) The composition of claim 112 wherein X is NR_{110} and Y is $\text{CR}_{124}\text{R}_{125}$.

114. (Withdrawn) The composition of claim 107 wherein the inhibitor is of the structure



wherein

R_{126} and R_{127} are independently selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, heterocyclic, substituted alkyl, substituted aryl, OR_{110} , $\text{NR}_{110}\text{R}_{111}$, SR_{110} , NO_2 , NO, CN, COR_{112} , and halogen,

R_{110} and R_{111} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, substituted alkyl or aryl where the substituents are C, O, N, S, or P, and COR_{102} or R_{110} and R_{111} can be taken together to form a ring structure of five to seven members;

R_{112} is R_{102} , OR_{102} , or $\text{NR}_{102}\text{R}_{103}$; and

R_{102} and R_{103} are independently selected from the group consisting of hydrogen, alkyl, aryl, benzyl, cyclic, heterocyclic, and substituted alkyl or aryl where the substituents are C, O, N, S, or P, or R_{102} and R_{103} can be taken together to form a ring structure of five to seven members.

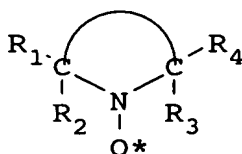
115. (Withdrawn) The composition of claim 107 wherein the first inhibitor is selected from the group consisting of phenylacetylene, 2,5-di-t-butyl-1,4-benzoquinone, 2,6-di-t-butyl-1,4-benzoquinone, 1,4-benzoquinone, 2-methylantraquinone, 1,4-naphthoquinone, 2,6-di-t-butyl-4-(phenylmethylene)-2,5-cyclohexadiene-1-one, 2,6-di-t-butyl-4-(phenylimino)-2,5-cyclohexadiene-1-one, and ethyl 3,4-bis-(3,5-di-t-butyl-4-one-2,5-cyclohexadienylidene)-hexane-1,6-dioate.

116. (Withdrawn) The composition of claim 107 wherein a transition metal is added.

117. (Withdrawn) The composition of claim 116 wherein the transition metal is copper.

118. (Withdrawn) The composition of claim 90 wherein the first inhibitor is a blend of a hydrogen donor and an electron acceptor.

119. (Withdrawn) The composition of claim 90 wherein the second inhibitor is of the structure



wherein R₁ and R₄ are independently selected from the group consisting of hydrogen, alkyl, and heteroatom-substituted alkyl and R₂ and R₃ are independently selected from the group

consisting of alkyl and heteroatom-substituted alkyl, and the



portion represents the atoms necessary to form a five-, six-, or seven-membered heterocyclic ring.

120. (Withdrawn) The composition of claim 90 wherein the second inhibitor is a blend of two nitroxyls.

121. (Withdrawn) The composition of claim 119 wherein the second inhibitor contains one or more nitroxyls selected from the group consisting of:

N,N-di-*tert*-butylnitroxide;

N,N-di-*tert*-amylnitroxide;

N-*tert*-butyl-2-methyl-1-phenyl-propylnitroxide;

N-*tert*-butyl-1-diethylphosphono-2,2-dimethylpropylnitroxide;

2,2,6,6-tetramethyl-piperidinyloxy;

4-amino-2,2,6,6-tetramethyl-piperidinyloxy;

4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;

4-oxo-2,2,6,6-tetramethyl-piperidinyloxy;

4-dimethylamino-2,2,6,6-tetramethyl-piperidinyloxy;

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4-ethanoyloxy-2,2,6,6-tetramethyl-piperidinyloxy;
2,2,5,5-tetramethylpyrrolidinyloxy;
3-amino-2,2,5,5-tetramethylpyrrolidinyloxy;
2,2,4,4-tetramethyl-1-oxa-3-azacyclopentyl-3-oxy;
2,2,4,4-tetramethyl-1-oxa-3-pyrrolinyl-1-oxy-3-carboxylic acid;
2,2,3,3,5,5,6,6-octamethyl-1,4-diazacyclohexyl-1,4-dioxy;
4-bromo-2,2,6,6-tetramethyl-piperidinyloxy;
4-chloro-2,2,6,6-tetramethyl-piperidinyloxy;
4-iodo-2,2,6,6-tetramethyl-piperidinyloxy;
4-fluoro-2,2,6,6-tetramethyl-piperidinyloxy;
4-cyano-2,2,6,6-tetramethyl-piperidinyloxy;
4-carboxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbomethoxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbethoxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-cyano-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-methyl-2,2,6,6-tetramethyl-piperidinyloxy;
4-carbethoxy-4-hydroxy-2,2,6,6-tetramethyl-piperidinyloxy;
4-hydroxy-4-(1-hydroxypropyl)-2,2,6,6-tetramethyl-piperidinyloxy;
4-methyl-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-carboxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-carbomethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;

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4-carbethoxy-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-amino-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
4-amido-2,2,6,6-tetramethyl-1,2,5,6-tetrahydropyridine -1-oxyl;
3,4-diketo-2,2,5,5-tetramethylpyrrolidinyloxy;
3-keto-4-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;
3-keto-4-benzylidene-2,2,5,5-tetramethylpyrrolidinyloxy;
3-keto-4,4-dibromo-2,2,5,5-tetramethylpyrrolidinyloxy;
2,2,3,3,5,5-hexamethylpyrrolidinyloxy;
3-carboximido-2,2,5,5-tetramethylpyrrolidinyloxy;
3-oximino-2,2,5,5-tetramethylpyrrolidinyloxy;
3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-cyano-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-carbomethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
3-carbethoxy-3-hydroxy-2,2,5,5-tetramethylpyrrolidinyloxy;
2,2,5,5-tetramethyl-3-carboxamido-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-amino-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-carbethoxy-2,5-dihydropyrrole-1-oxyl;
2,2,5,5-tetramethyl-3-cyano-2,5-dihydropyrrole-1-oxyl;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)succinate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)sebacate;

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bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)n-butylmalonate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)phthalate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)isophthalate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)terephthalate;
bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)hexahydroterephthalate;
N,N'-bis(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)adipamide;
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-caprolactam;
N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)-dodecylsuccinimide;
2,4,6-tris-[N-butyl-N-(1-oxyl-2,2,6,6-tetramethylpiperidin-4-yl)]-s-triazine; and
4,4'-ethylenebis(1-oxyl-2,2,6,6-tetramethylpiperazin-3-one).

122. (New) The method of claim 1 wherein the inhibitor is selected from the group consisting of 2,4-dinitro-6-sec-butylphenol and N-methyl-4-nitroaniline.

123. (New) The method of claim 44 wherein the first inhibitor is selected from the group consisting of 2,4-dinitro-6-sec-butylphenol and N-methyl-4-nitroaniline.